

EFFICACY OF AV/FRC/18 (KEETGUARD LIQUID) AGAINST MITE INFESTATION (*SARCOPTIS* SPP.) IN BUFFALO CALVES

A.K. Tripathi*, J.S. Soodan and R. Katoch

ABSTRACT

In present investigation efficacy of AV/FRC/18 (Keetguard Liquid) a polyherbal ectoparasiticide were assessed against mite infestation in buffalo calves. All the animals were infested with *Sarcoptes* spp. of mites. Percent efficacy of AV/FRC/18 against mite infestation was recorded and it was found that thrice a week application of 1:20 dilution results in 98% on day 7th post-treatment and maximum period of effectiveness was found 90% up to 30 days post treatment. Lesion scores were also recorded and it was found that on application of AV/FRC/18 thrice a week all the lesions were subsided on day 7th post treatment.

Keywords: *Bubalus bubalis*, buffalo, efficacy, AV/FRC/18, buffalo calves, *Sarcoptes* spp.

mange is more common in buffaloes and particularly severe in calves (Patel *et al.*, 2002a). Problem of ectoparasite load pose a serious impact on the individual and national economics of developing countries like India, therefore there should be a suitable ectoparasite control strategy. The major constraint of chemical treatment is the development of resistance (Radostits *et al.*, 2000). Several synthetic ectoparasiticide drugs had been used without much success. Therefore, now a day's, many herbal preparation had been developed and used for killing the pest, insect etc. because they lack of side effect, low cost and target efficiency. However, this process is going on from ancient time for curing against disease, mention in Ayurveda and many other books (Habeeb, 2010). Keeping this in view the present study had been planned to assess the efficacy of AV/FRC/18 (Keetguard Liquid) a polyherbal ectoparasiticide against mite infestation in buffalo calves.

INTRODUCTION

Sarcoptes scabiei is an obligate burrowing skin parasite causes scabies in man and sarcoptic mange in a wide range of domestic and wild mammals (Bornstein *et al.*, 2001). Sarcoptic

MATERIALS AND METHODS

To assess the efficacy of AV/FRC/18 (Keetguard Liquid) against mite infestation, a total of 24 buffalo calves of 3 to 6 month age

group of either sex, include sick animals brought for treatment at college clinic and local farmers from R.S. Pura were selected. As a first step, each selected animal was examined for live mites by taking a skin scraping of affected area before and after treatment application. Then the microscopic examination for adult mites was carried on samples prepared in 10% KOH solution (Soulsby, 1986). The mean number of live mites per microscopic field was calculated in each case at different days of observations as per the method given by Liebsh, 1986. Based on the preliminary results of mite infestation, the animals were divided into four groups A, B, C and D with 6 animals in each. Animals of Group A treated with 1:20 dilution of AV/FRC/18 applied twice for a week, Group B treated with 1:20 dilution of AV/FRC/18 applied thrice for a week, Group C treated with 1:1000 dilution of Cypermethrin applied twice for a week, Group D were kept as mite infested untreated control, which were simultaneously applied plain tap water. The examination of the skin scraping was repeated every week until the 4th week of post treatment. The disappearance of skin lesions and itching were also recorded.

The percent efficacy of treatment was assessed by percent ratio of mean live mite count per microscopic field of treated and control group of animals at different days of post-treatment observation of affected region. The time required for disappearance of skin lesions and itching was also recorded. Re-infestation time was also recorded for each group. The percentage efficacy of test drug against mite infestation was determined by comparing the mean live mite count per microscopic field in affected area of treated group and control group using the following formula (EMEA, 2004) at different observation days.

$$\% \text{ Efficacy} = 100 \times \frac{(C-T)}{C}$$

Where C = mean of the control group

T = mean of the treated group

(Counts of mites (Microscopically) in individual animals, were done at different days of observations, by counting live mites per microscopic field of affected area by microscopic examination of mites on samples prepared in 10% KOH. Mean counts at different observation day were calculated for each group)

Assessment of lesions/lesion scores in mite infestation

Degree of severity, lesions and pruritus were assessed as per a scale of 1 to 5 at the beginning of trial and during each day of observation on the basis of visual perception and information regarding pruritus collected from animal owners and lesion scores were recorded as per the scale given below (Table 1).

RESULTS AND DISCUSSION

Maximum efficacy in Group A was 80% on 7th day and in Group B it was 98% on 7th day. However in Group C maximum efficacy was 50% on 7th day. The lesions and itching subsided in all the treated groups with maximum efficacy in Group B followed by Group A and least in Group C. During the present investigation re-infestation was not recorded in any animals of Group B and A treated with AV/FRC/18 (Keetguard Liquid) and complete disappearance of skin lesions after 21 days without any further progression of lesions, while in Cypermethrin treated Groups C, skin lesions not

disappears but there was further progression of lesions during entire study period and re-infestation were also observed. Maximum re-infestation takes place in Group C, and drug not found effective up to 21 days, while in AV/FRC/18 (Keetguard Liquid) treated Group B and A the drug remains effective up to 21 days and minimum re-infestation takes place in Group B followed by Group A. In Group B the efficacy remains (>50%) up to 60 days of observations. This is as per the recommendation of WHO (1996) Criterion which states that there should be Minimum 90% reduction in infestation for one week and 75% reduction in infestation for one month based on pre and post-treatment counts in comparison with untreated controls (Table 2).

During the entire study period no adverse effect was recorded clinically in any animal treated by AV/FRC/18 (Keetguard Liquid) however in Cypermethrin treated groups the redness and skin rashes had been recorded in few animals. During present investigation it was found that efficacy of AV/FRC/18 (Keetguard Liquid) was remains the same even after repeated applications on the same animals, while in Cypermethrin efficacy is gradually reduced on repeated application on the same animals it suggests that mites are not showing resistance to the AV/FRC/18. The AV/FRC/18 (Keetguard Liquid) is a polyherbal mixture therefore it had several advantageous effects such as more effective, no chemical reactions than synthetic compound (cypermethrin) without showing any resistance (Swarup and Patra 2005).

AV/FRC/18 application 1:20 dilutions thrice a week can be used to control mite infestation with maximum efficacy (98%) on day 7, and maximum period of effectiveness (90% up to 30 days) and without any noticeable adverse

effect. It might have occurred due to the fact that thrice application kills all the developing stages of mites infested on animals which might not be achieved by twice application which was visible on mite counting at different days of observations therefore in animals where AV/FRC/18 applied thrice/week showed minimum re-infestation of mite which might have occurred from surrounding untreated infected animals. Similar findings were also reported by Kumar *et al.* (2000). A great deal of recovery in lesions produced by mite infestation was assessed by lesion scores and it was found that on application of AV/FRC/18 (Keetguard Liquid) thrice a week all the lesions were subsided on day 7 with a lesion score of 1 while no complete disappearance of lesions were seen after twice application of the same drug with minimum lesion scores was 2 on day 7. In Cypermethrin treated group lesion scores were not changed much with minimum lesion score was 4 on day 7 (Table 3).

From this study it can be interpreted that AV/FRC/18 (Keetguard Liquid) is not only killing the mites burrowed in skin but it also helps in regeneration of skin architecture lost due to mite infestation which was greatly evident by lesion scores and therefore it was another great advantage of the tested compound which is a polyherbal mixture therefore it had several advantageous effects (Swarup and Patra 2005).

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Table 1. Lesions and pruritus were assessed as per a scale of 1 to 5.

Lesion scores	Clinical signs
1	No pruritus, no any visible alopecia or excoriations, no crusts, no rubbing, and chewing
2	Very mild pruritus, occasional signs of rubbing and chewing which last for a few seconds without signs of alopecia or excoriation
3	Moderate pruritus, rubbing and chewing for extended periods and signs of alopecia without excoriation
4	Moderate to severe pruritus, rubbing and chewing for extended periods and signs of alopecia and excoriation
5	Severe pruritus, rubbing and chewing almost constantly and signs of alopecia and excoriation

Table 2. Efficacy of AV/FRC/18 against Mite infestation in buffalo calves.

DPT/ Observation day	Mean percent control (Efficacy) and average mean live mite count per microscopic field against natural cases of mite infestation in buffalo calves			
	Group A	Group B	Group C	Group D
1	60.00 (10)	60.00 (10)	30.00 (17)	00.00 (25)
3	80.00 (6)	80.00 (6)	45.00 (15)	00.00 (28)
7	80.00 (6)	98.00 (1)	50.00 (15)	00.00 (30)
21	60.00 (18)	90.00 (5)	30.00 (32)	00.00 (45)
30	60.00 (20)	90.00 (5)	20.00 (40)	00.00 (50)

Note:- counts were done on 24 h after the application of drugs.

Table 3. Lesion scores.

DPT/ Observation day	Lesion scores			
	Group A	Group B	Group C	Group D
1	4	4	5	5
3	3	3	4	5
7	2	1	4	5
21	3	1	4	5
30	3	1	4	5

DPT: Days post treatment.

REFERENCES

- Bornstein, S., T. Morner and W.M. Samuel. 2001. *Sarcoptes scabiei* and sarcoptic mange, p. 107-109. In Samuel, W.M., M.J. Pybus and A.A. Koean (eds.) *Parasitic Diseases of Wild Mammals*, 3rd ed. Iowa State University Press, Ames, Iowa, USA.
- Committee for Medicinal Products for Veterinary Use, CVMP. 2004. *Guideline on Specific Efficacy Requirements for Ectoparasiticides in Cattle*. European Medicines Agency (EMA). Veterinary Medicines and Inspections. UK.
- Habeeb, S.M. 2010. Ethno-veterinary and medical knowledge of crude plant extracts and its methods of application (traditional and modern) for tick control. *World Applied Sciences Journal*, **110**: 1047-1054.
- Kumar, R., P.P.S. Chauhan, R.D. Agrawal and D. Shankar. 2000. Efficacy of herbal ectoparasiticide AV/EPP/14 against lice and tick infestation on buffalo and cattle. *J. Vet. Parasitol.*, **14**: 167-169.
- Liebsh, A. 1986. Bayticol pour-on: A new product and a new method for the control of stationary ectoparasites in cattle. *Veterinary Medicine Review*, **1**: 17-27.
- Patel, J.S., P.R. Patel and H.H. Pachasara. 2002a. Economic losses due to sarcoptic mange in buffalo calves. *Veterinary Practice*, **3**: 186-189.
- Radostits, O.M., G.C. Gay, D.C. Blood and K.W. Hinchcliff. 2000. *Veterinary Medicine: A Textbook of the Diseases of Cattle Sheep, Pigs, Buffalo Calves and Horses*, 9th ed. Book Power. London, UK.
- Soulsby, E.J.L. 1986. *Helminths, Arthropods and Protozoa of Domesticated Animals*, 7th ed. Bailliere Tindall, London, UK.
- Swarup, D. and R.C. Patra. 2005. Herbal therapy in veterinary practice, national workshop, under ASCAD, on use of alternative medicine in veterinary practice. *Compendium*, p. 1-13.
- WHO. 1996. *Report of the WHO Informal Consultation on the Evaluation and Testing of Insecticides*, World Health Organization, Geneva, Switzerland.